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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,887	07/30/2003	Takao Ohnishi	791_204 NP	7943
25191	7590	07/06/2006	EXAMINER	
BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			LIN, JAMES	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 07/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/630,887

Applicant(s)

OHNISHI ET AL.

Examiner

Jimmy Lin

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/16/03, 6/25/04</u> | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference numbers "80" and "81", Fig. 14(b). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "81" has been used to designate both a liquid supply source (Figs. 8a,8b,10) and a coated portion as shown in Fig. 14b. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities: The specification states that a coating liquid is applied in such a way as to coat a predetermined position of at least one of the electrodes [0009]. However, the

Art Unit: 1762

specification later recites that the coating liquid is applied while avoiding the coating of the electrodes (i.e., [0058]). Was it actually meant to recite that the coating liquid coats the electrodes at a predetermined position while avoiding the coating of the other portions of the electrodes?

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "a piezoelectric/electrostrictive film type device" renders the claims indefinite. It is unclear as to what a piezoelectric/electrostrictive film *type* device encompasses. Therefore it is suggested to change the phrase to "a piezoelectric/electrostrictive film device".

6. Claims 4-5 and 10-11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "an amount which differs with a position to be applied" is unclear. Is "a position to be applied" referring to the position of the nozzle or the position on the substrate? The phrase seems to be referring to Fig. 7, where the coating liquid 1a,2,3 are applied in different amounts depending on where the coating liquid is to be applied on the ceramic substrate. The phrase needs to be clarified.

Below are suggestions to further clarify the claimed subject matter.

7. Claim 1:

The phrase "formed beyond at least one of the electrodes, thereby the ends of the layer is projected" (line 8-9) sounds awkward. It is suggested that the phrase should be changed to "formed beyond at least one of the electrodes, so that the ends of the

Art Unit: 1762

piezoelectric/electrostrictive layer are projected beyond the ends of said at least one electrode”.

The phrase “in a range broader than that of at least one of electrodes to project ends of the piezoelectric/electrostrictive layer” (lines 12-14) should be changed to “so that the ends of the piezoelectric/electrostrictive layer project beyond the ends of at least of one the electrodes”.

The phrase “said at least one of electrodes electrode” (lines 20-21) should be changed to “said at least one of electrode”.

The phrase “to couple ends of a projected portion” (line 23) should be changed to “which couples ends of said projected portion”.

8. Claim 7:

The term “a multilayered structure” (line 10) is indefinite and does not further limit claim 1. The claim can be clarified to recite as that disclosed in [0010] (i.e., a multilayered structure of the piezoelectric/electrostrictive operation portion in which a plurality of electrodes and a plurality of piezoelectric/electrostrictive layers are alternatively stacked on the ceramic substrate).

9. Claims 2,8:

The phrase “a position opposite to the pressurizing chamber on the substrate” (lines 15-16 and lines 1-2, respectively) can be clarified by reciting “a position opposite to the pressurizing chamber on the discharge head substrate”. The term “the substrate” can be confused with the ceramic substrate of claim 1.

10. Claims 6,12:

The term “the substrate” (line 4 and line 17, respectively) should be changed to “the ceramic substrate” to clearly distinguish from the discharge head substrate from claims 2,8.

11. Claims 4,10:

The term “and” (line 16 and line 2, respectively) should be changed to “or”, as supported in [0013].

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 1762

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 4-5 and 10-11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for using the on-demand type fine coating apparatus of claims 3,9 in combination with the continuous fine coating apparatus of claims 2,8 in order to apply a finer pattern and a broader pattern [0056], does not reasonably provide enablement for independently using the on-demand type fine coating apparatus of claims 3,9 and the continuous fine coating apparatus of claims 2,8 to apply different amounts of a coating liquid which differs with a position to be applied. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The claims suggest that the on-demand type fine coating apparatus of claims 3,9 and the continuous fine coating apparatus of claims 2,8, being used independently, can deposit different amounts of coating liquid, such as the different amounts of coating liquid 1a,2,3 shown in Fig. 7. However, the specification shows that different amounts coating liquid can be applied only when a combination of the on-demand type fine coating apparatus and the continuous fine coating apparatus are used together. The on-demand type fine coating apparatus is used to apply a very fine pattern (i.e., coating liquid 1a,3), and the continuous fine coating apparatus is used for the application in the broad range (i.e., coating liquid 2) [0056].

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 1762

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1, 6, 7, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Takahashi et al. (2004/0007947).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The provisional application No. 60/395,503 has been reviewed and a copy is provided herein.

Takahashi '503 discloses a piezoelectric film device, comprising:  
a lower electrode, a piezoelectric layer, and an upper electrode successively formed over a ceramic substrate;

forming the piezoelectric layer so that the ends of the piezoelectric layer project beyond the ends of at least one of the electrodes;

coating a coating liquid prepared by admixing a polymerizable oligomer and inorganic particles in a dispersing medium through a gap between the projecting portion of the piezoelectric layer and the substrate and coat a predetermined portion of said at least one electrode [0018].

Takahashi does not explicitly teach that the coating liquid is dried. However, a spin coating method is performed immediately after coating the coating liquid. The rotation speed of 2500 rpm or more (pg. 35, lines 9-20) will cause some degree of drying.

Claim 7: A piezoelectric operation portion can include a plurality of electrodes and a plurality of piezoelectric layers which are alternately stacked on the ceramic substrate. [0019].

Claims 6,11: The coating liquid can be applied by a spin coat process at a rotation speed of 1500 rpm or more. The rotation of the substrate will cause at least some degree of vibration on the ceramic substrate or the piezoelectric layer.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takeuchi et al. (6,088,893) discloses a piezoelectric layer 14 projecting beyond a bottom and top electrode 12,16 and a coating liquid 20 of inorganic particles deposited in the gap between the projecting piezoelectric layer and the substrate.

Takeuchi et al. (5,376,857) discloses a piezoelectric layer 5 projecting beyond a lower electrode 4. An incompletely bonded region 8 is formed between the piezoelectric layer and the substrate. The incompletely bonded region can be formed by initially providing the substrate with dummy layers and subsequently forming the piezoelectric layer. The dummy layers preferably comprise a resin which can be burned out and partly or completely extinguished during the heat treatment of the piezoelectric layer (column 4 line 56 – column 5 line 8).

Kitahara et al. (5,856,837) discloses a piezoelectric layer 1 projecting beyond a lower electrode 20 (Figs. 9-10). An electrically insulating layer 8 is formed between the projecting piezoelectric layer and the substrate.

Takahashi et al. (2003/0234595) discloses a piezoelectric layer projecting beyond the lower and upper electrodes. The coupling member comprises an organic-inorganic hybridized material.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Thursday 8 - 5:30 and Friday 8 - 4:30.

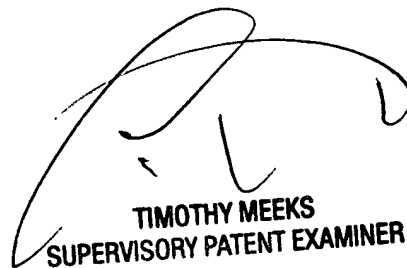
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

06/23/2006



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**